

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Hinkson Creek

Water Body Segment at a Glance:

County: Boone
Nearby Cities: Columbia
Length of impaired segment:
 Water Body ID 1007: 6 miles
 1008: 18 miles
Length of impairment within segment:
 Water Body ID 1007: 6 miles
 1008: 6.3 miles
Pollutant: Unknown
Source: Urban Runoff



State map showing location of watershed

Scheduled for TMDL Development: Established by EPA 2011

Description of the Problem

Designated Beneficial Uses of Hinkson Creek (Class P (1007) portion with permanent flow)

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category B
- Secondary Contact Recreation

Designated Beneficial Uses of Hinkson Creek (Class C (1008) portion with intermittent flow, permanent pools)

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category B

Use that is Impaired

- Protection of Warm Water Aquatic Life

Standards that Apply

Because the pollutants in Hinkson Creek are unknown, specific criteria cannot be cited. However, all Missouri streams are protected by the general criteria contained in Missouri's Water Quality Standards at 10 CSR 20-7.031 (3). The general criteria that apply to Hinkson Creek state:

- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
- (G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

Background information and Hinkson Creek water quality study results

The impaired portion of Hinkson Creek begins south of Interstate-70 and flows through the city of Columbia to the stream's confluence with Perche Creek. Although pollutants and sources are listed as unknown, Hinkson Creek exhibits water quality problems typically associated with streams in urban areas that include:

1. Larger and more frequent floods, as well as lower base flows, due to the increase in impervious surfaces (e.g. rooftops, paved roads and parking lots) in the watershed;
2. Increased soil erosion in construction and development areas with subsequent deposition of the soil in streams;
3. Water contamination from urban storm water flows;
4. Degradation of habitat for aquatic organisms due to the concerns listed above;
5. Degradation of aquatic habitat due to the physical alteration of stream channels and adjacent streamside (riparian) corridors. Such practices include:
 - Enclosing the stream in a large pipe.
 - Straightening (channelizing) the stream.
 - Paving the stream bottom and/or banks with concrete or rip rap.
 - Removing trees and other permanent vegetation near streams.

The Department of Natural Resources (Department) has received citizen reports regarding all five of the water quality problems mentioned above. To determine the pollutants and sources impairing Hinkson Creek, the Department conducted a series of water quality studies from 2002 – 2006. A one-year bioassessment study of aquatic invertebrate communities was conducted in 2002. The results of this study initiated a second, three-year study in 2003 that focused on storm water runoff. The second study continued through 2006 and had the goal of identifying potential pollutants and pollutant sources impacting Hinkson Creek.

The 2002 bioassessment study verified that the aquatic community in a portion of Hinkson Creek downstream of Interstate-70 is impaired. Hinkson Creek was compared to a similar sized portion of nearby Bonne Femme Creek, which is relatively unimpacted by human activity, as well as to biological reference stream sites within the same ecological drainage unit. These comparisons verified the impairment of Hinkson Creek, but did not definitively determine potential pollutants or pollutant sources.

Results of Phase I of the second water quality study documented the aquatic community was impaired in Hinkson Creek between Interstate-70 and Broadway and that the impairment extended downstream. The Department collected water quality samples during base flow and storm events and analyzed them for toxicity, nutrients, metals, organic chemicals and *E. coli* bacteria. In addition, field measurements of pH, temperature, specific conductivity, dissolved oxygen and discharge were collected. Phases II and III of the water quality study were conducted similarly. At times and in different locations, various pollutants were found in amounts harmful to the aquatic communities in Hinkson Creek. For example, at times chloride and *E. coli* concentrations were too high, dissolved oxygen concentrations too low, toxicity was found, and excessive erosion and sedimentation were noted. However, no one pollutant or condition could be identified as the source(s) of the impairment. Therefore, for the TMDL, the Department chose to use storm water runoff volume as a surrogate in place of a traditional “pollutant of concern” approach. The Department believes that reducing storm water runoff volume can achieve the following conditions that should restore the aquatic life designated use in Hinkson Creek:

- reduce physical impacts of storm water on the stream channel and stream habitat (e.g. erosion, scour and deposition);
- raise the water table and restore the in-stream habitat provided by increased base flow;
- reduce pollutant loads associated with storm water.

Many activities are underway to improve the condition of Hinkson Creek. From 2004 to 2008, the Hinkson Creek Watershed Restoration Project has worked to educate the community about water quality and nonpoint source storm water issues and to inform residents about what business and individuals can do to help. The Hinkson Creek Watershed Restoration Project has also planted many trees, built rain gardens, set up rain barrels and installed other best management practices within the watershed. The project was renewed in the spring of 2008 with the aim of locating prospects for retrofitting storm water treatment structures and monitoring how the improvements are affecting the creek. In addition, educational efforts will continue and a draft Hinkson Creek Watershed Management Plan has been written and is currently undergoing stakeholder review.

An additional mechanism that will aid in restoring water quality in Hinkson Creek is the Municipal Separate Storm Sewer System permit, referred to as the MS4, which has Boone County, the city of Columbia and the University of Missouri at Columbia as co-permittees. The initial MS4 permit was issued in May 2003 and requires implementation of a comprehensive storm water management program. The goals of the storm water management program are to minimize the negative impacts of storm water on water quality and the aquatic ecosystem, to remove illicit discharges from the storm sewer system, and to provide long-term protection. One of the most important and effective ways to accomplish these goals is to reduce the volume of storm water runoff.

A new project in the watershed consists of monitoring stream flow and several potential pollutants in Hinkson Creek at five different sites. The data that are being collected will help fill in gaps and assist in determining what is causing the creek to be impaired. The data will also show if current and future efforts at water quality restoration are effective. All of the above mentioned efforts, and others to be determined, will work together to hopefully return a healthy biological community to Hinkson Creek.

The Hinkson Creek TMDL was established by the U.S. Environmental Protection Agency, or EPA, January 28, 2011.

The following Web sites contain reports for the water quality studies discussed above:

Full reports for Hinkson Creek studies Phases I-III:

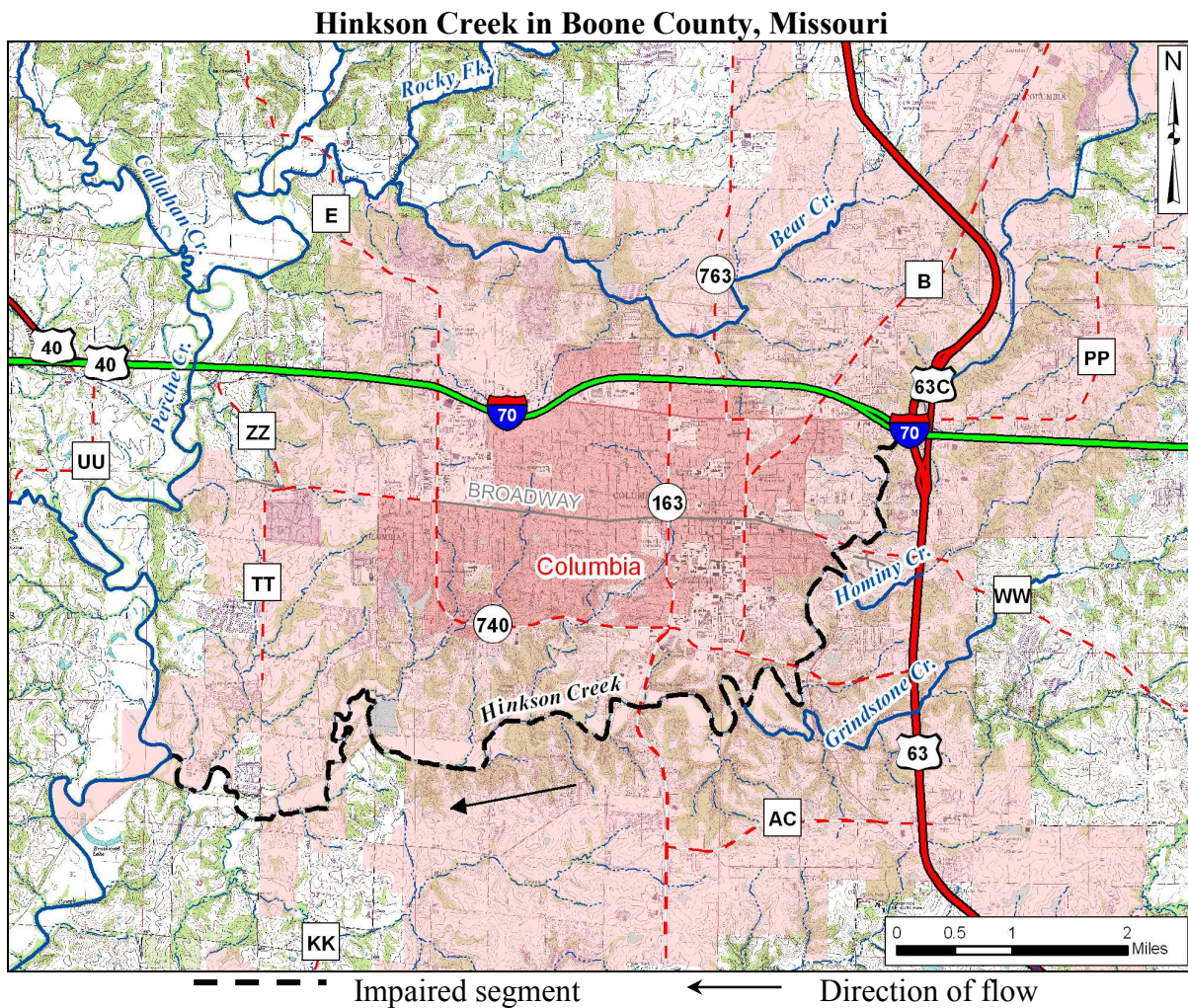
Go to the Environmental Services Program, Protecting Our Water page,

<http://www.dnr.mo.gov/env/esp/esp-wqm.htm> ...and scroll down a little to find the Hinkson Creek Stream Study with links to Phases I – III.

For the full report on the biological aquatic community study, go to:

<http://www.dnr.mo.gov/env/esp/wqm/NortheastRegionBioassessments.htm>

...and click on the Hinkson Creek report date of “2001-2002”.



For more information call or write:

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Water Protection Program

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